

WHAT IS CLAIMED IS:

- 1                   1.     A trusted high stability time source for use with a digital time  
2     stamping service and a trusted external time source, the time source comprising:  
3                   a private time source indicating a private time;  
4                   a published time source indicating a published time;  
5                   at least one power supply arranged to power the private time source  
6     and the published time source; and  
7                   control logic programmed to perform a time stamping operation by  
8     receiving a message, appending the published time to the message to create a  
9     timestamp, and digitally signing the timestamp with a private key, the control logic  
10    being further programmed to perform a published time source update by sending a  
11    request to the trusted external time source for a published time update, receiving a  
12    reply from the trusted external time source including the published time update, and  
13    updating the published time with the published time update if an update condition  
14    is satisfied, wherein the update condition is based in part on a time difference  
15    between the private time and the published time update.
- 1                   2.     The trusted high stability time source of claim 1 further  
2     comprising:  
3                   a printed circuit board including a connector for connecting to a bus  
4     of a computer, wherein the private time source, the published time source, the at  
5     least one power supply, and the control logic are mounted to the printed circuit  
6     board.
- 1                   3.     The trusted high stability time source of claim 1 further  
2     comprising:  
3                   a first crystal oscillator configured to stabilize the private time  
4     source; and  
5                   a second crystal oscillator configured to stabilize the published time  
6     source.

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1                   4.     The trusted high stability time source of claim 1 wherein the  
2 control logic is programmed to perform the published time source update at least  
3 once per month.

1                   5.     The trusted high stability time source of claim 1 wherein the  
2 update condition is not satisfied when the time difference between the private time  
3 and the published time update is greater than 6 hours.

1                   6.     The trusted high stability time source of claim 1 wherein the  
2 control logic updates the published time with the published time update in an update  
3 manner that is based on a time difference between the published time and the  
4 published time update.

1                   7.     The trusted high stability time source of claim 6 wherein the  
2 update manner is a normal update manner when the time difference between the  
3 published time and the published time update is not greater than 5 seconds,  
4 otherwise, the update manner is a slow update manner.

1                   8.     The trusted high stability time source of claim 7 wherein the  
2 control logic is programmed to perform the published time source update once per  
3 day.

1                   9.     The trusted high stability time source of claim 1 wherein the  
2 update condition is further based on an elapsed time between sending the request and  
3 receiving the reply.

1                   10.    The trusted high stability time source of claim 9 wherein the  
2 update condition is not satisfied when the elapsed time between sending the request  
3 and receiving the reply is greater than 15 seconds.

1                   11.    The trusted high stability time source of claim 1 wherein the  
2 control logic is further programmed to compare the private time with the published  
3 time to determine a time difference, and to indicate that the trusted high stability

4 time source has expired when the time difference exceeds a predetermined  
5 threshold.

1 12. The trusted high stability time source of claim 11 wherein the  
2 predetermined threshold is 6 hours.

1 13. The trusted high stability time source of claim 1 further  
2 comprising:

3 a tamperproof enclosure encapsulating the private time source, the  
4 published time source, and the control logic.